

CLAIM AMENDMENTS

IN THE CLAIMS

This listing of the claims will replace all prior versions, and listing, of claims in the application or previous response to office action:

1. (Currently Amended) An apparatus for assigning parameters to, configuring and starting up a control system and for creating a control program comprising:

- an engineering system comprising:

- an editing device comprising a display for generating and editing a control program,

and

- a first compiler for compiling the control program, wherein upon manual input by a user the editing device is ~~used~~-operable to mark an area of the control program for debugging wherein said marked area is graphically indicated on said display, and the compiling device is used to produce from the control program an intermediate machine independent code which contains debug instrumentation for the marked area of the control program, wherein the debug instrumentation allows for analyzing values of variables used within the marked area,

and

- a runtime system comprising:

- a second compiler for generating a microprocessor specific code for said runtime system; and

- a debugger for generating debug information for said engineering system according to said debug instrumentation.

2. (Canceled)

3. (Original) The apparatus according to claim 1, further comprising a data storage device for association information for associating the marked area of the control program with an area of the intermediate code.

4. (Original) The apparatus according to claim 1, wherein the editing device comprises an order unit for dispatching an observation order for the marked area.

5. (Original) The apparatus according to claim 1, wherein the editing device further comprises a reception device for receiving observation information.

6. (Canceled)

7. (Previously Presented) The apparatus according to claim 1, wherein the runtime system further comprises an observation module using the debug instrumentation.

8. (Previously Presented) The apparatus according to claim 7, wherein the runtime system further comprises a data buffer for storing and providing observation information from the observation module.

9. (Previously Presented) The apparatus according to claim 7, wherein the runtime system further comprises a device for receiving an execution order for the observation module.

10. (Canceled)

11. (Currently Amended) A method for assigning parameters to, configuring and starting up a control system and for creating a control program in an automation system comprising the steps of:

- displaying a code of a control program on a display;
- editing ~~a~~the control program within an engineering system,
- graphically marking an area of the control program for debugging during editing,
- compiling the control program to generate an intermediate machine independent code from the control program, said intermediate code containing debug instrumentation for the marked area of the control program,
- transmitting said intermediate code to a runtime system,
- compiling said intermediate code into a machine code for said runtime system,
- executing said machine code and providing said engineering system with debug information according to said debug instrumentation.

12. (Canceled)

13. (Original) The method according to claim 11, wherein the marked area of the control program is associated with an area of the intermediate code.

14. (Original) The method according to claim 11, further comprising dispatching an observation order for observing the marked area during editing.

15. (Original) The method according to claim 14, wherein observation information is received during editing.

16. (Canceled)

17. (Previously Presented) The method according to claim 11, further comprising setting up an observation module in said runtime system using the debug instrumentation.

18. (Original) The method according to claim 17, further comprising storing and providing information from the observation module in a data buffer device.

19. (Original) The method according to claim 17, further comprising receiving and carrying out an execution order for the observation module during execution of the control program.

20. (Canceled)

21. (Original) An apparatus according to claim 1, wherein the control program is a cyclic control program.

22-23. (Canceled)

24. (Original) A method according to claim 11, wherein the control program is a cyclic control program.

25-26. (Canceled)

27. (Currently Amended) An apparatus according to claim 1, wherein the ~~engineering system further comprises a display and means for displaying~~code of said control program is displayed in a first window and said debug information in a second window on said display.

28. (Currently Amended) A method according to claim 11, further comprising the step of displaying said control program in a first window of ~~a the display device~~ and said debug information in a second window of the display ~~device of the engineering system~~.

29. (NEW) An apparatus according to claim 27, wherein said debug information includes the values of said variables.

30. (NEW) A method according to claim 28, wherein during execution of said control program values of all variables within said marked area are displayed on said display.